WE CLAIM:

1. A carbon deposit inhibiting thermal barrier coating for an element in a gas turbine engine, such coating comprising:

a layer of thermal barrier material formed on an exposed surface of a gas turbine engine element; and

a layer of carbon deposit inhibiting material formed on top of the layer of thermal barrier material.

2. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the gas turbine engine element is a combustor wall.

3. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the gas turbine engine element is a swirler.

4. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the thermal barrier material is a ceramic material.

5. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the thermal barrier material is a ceramic material having sublayers, such as a bond coat, to facilitate oxidation resistance and adhesion to the underlying surface.

6. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the thermal barrier material is predominately stabilized zirconia.

7. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the thermal barrier material is predominately yttria stabilized zirconia.

8. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the thermal barrier layer has a thickness in the range of five to one hundred mils.

9. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the carbon deposit inhibiting material is a non-reactive, refractory oxide material.

10. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the carbon deposit inhibiting material is a non-reducible, refractory oxide.

11. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the carbon deposit inhibiting material is a refractory oxide selected from a group consisting of alumina, yttria, yttrium aluminum garnet, and lanthanum oxide.

12. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the carbon deposit inhibiting layer has a thickness in the range of one to fifty mils.

13. A carbon deposit inhibiting thermal barrier coating in accordance with Claim 1 wherein the carbon deposit inhibiting layer has a thickness in the range of one to five mils.

14. An article for use in a gas turbine engine, such article comprising:

a gas turbine engine element having a surface that will be exposed to engine gases and fuel droplets;

a layer of thermal barrier material coated onto the engine element surface that will be exposed; and

a layer of carbon deposit inhibiting material coated onto the outer surface of the thermal barrier material.

15. An article in accordance with Claim 14 wherein the gas turbine engine element is formed of a superalloy material.

16. An article in accordance with Claim 14 wherein the gas turbine engine element is formed of a ceramic material, such as silicon nitride or a silicon carbide composite material.

17. An article in accordance with Claim 14 wherein the gas turbine engine element is a combustor wall.

18. An article in accordance with Claim 14 wherein the gas turbine engine element is a swirler or fuel nozzle tip.

19. An article in accordance with Claim 14 wherein the thermal barrier material is a ceramic material.

20. An article in accordance with Claim 14 wherein the thermal barrier material is a ceramic material having sublayers, such as a bond coat, to facilitate oxidation resistance and adhesion to the underlying surface.

21. An article in accordance with Claim 14 wherein the thermal barrier material is predominately stabilized zirconia.

22. An article in accordance with Claim 14 wherein the thermal barrier material is predominately yttria stabilized zirconia.

23. An article in accordance with Claim 14 wherein the thermal barrier layer has a thickness in the range of five to one hundred mils.

24. An article in accordance with Claim 14 wherein the carbon deposit inhibiting material is a non-reducible, refractory oxide.

25. An article in accordance with Claim 14 wherein the carbon deposit inhibiting material is a refractory oxide selected from a group consisting of alumina, yttria, yttrium aluminum garnet, and lanthanum oxide.

26. An article in accordance with Claim 14 wherein the carbon deposit inhibiting layer has a thickness in the range of one to fifty mils.

27. An article in accordance with Claim 14 wherein the carbon deposit inhibiting layer has a thickness in the range of one to five mils.

28. An article in accordance with Claim 14 wherein:

the gas turbine engine element is a combustor wall formed of one of a superalloy, a silicon carbide composite, or a silicon nitride material;

the thermal barrier layer is composed predominately of yttria stabilized zirconia having a thickness in the range of five to one hundred mils; and

the carbon deposit inhibiting layer is composed of a non-reducible, refractory oxide selected from a group consisting of alumina, yttria, yttrium aluminum garnet, and lanthanum oxide and having a thickness in the range of one to five mils.

29. A method of forming a carbon deposit inhibiting thermal barrier coating on a gas turbine engine surface that will be exposed to the flow of burning engine gas and fuel droplets, such method comprising the steps of:

depositing a layer of thermal barrier material onto the engine surface that will be exposed; and

depositing a layer of carbon deposit inhibiting material onto the layer of thermal barrier material.

30. A method in accordance with Claim 29 wherein the thermal barrier material is a ceramic material.

31. A method in accordance with Claim 29 wherein the thermal barrier material is deposited to form a layer having a thickness in the range of five to one hundred mils.

32. A method in accordance with Claim 29 wherein the carbon deposit inhibiting material is a non-reducible refractory oxide.

33. A method in accordance with Claim 29 wherein the carbon deposit inhibiting material is a refractory oxide selected from a group consisting of alumina, yttria, yttrium aluminum garnet, and lanthanum oxide.

34. A method in accordance with Claim 29 wherein the carbon deposit inhibiting material is deposited to form a layer having a thickness in the range of one to fifty mils.

35. A method in accordance with Claim 29 wherein the carbon deposit inhibiting material is deposited to form a layer having a thickness in the range of one to five mils.

36. A method in accordance with Claim 29 wherein both layers are deposited by plasma spraying of the materials.

37. A method in accordance with Claim 36 wherein the carbon deposit inhibiting layer is applied to the thermal barrier layer by the same equipment immediately following deposition of the thermal barrier layer.

38. A method in accordance with Claim 29 wherein the layers are deposited by electron beam physical vapor deposition of the two materials.

39. A method in accordance with Claim 29 wherein each layer is deposited by a method selected from a group consisting of plasma spraying, electron beam physical vapor deposition, chemical vapor deposition, and slurry dipping.